OOP244SCC Quiz 5 question bank; please print the first three pages and bring them with you to the class.  
Story:

BarChart is a class designed to dynamically gather several sample integer values in itself and display them as a bar chart.

So a BarBhart holding the following values: 30, 50 and 40, will display itself as follows:

1:==============================  
2:==================================================  
3:========================================

You can open **11-June20.vcxproj** and test the execution of the class. The source code of the BarChart is partially posted to help you understand how it works.

BarChart:  
namespace sict {

class BarChart {

int\* m\_values;

int m\_size;

public:

BarChart(int size = 1);

BarChart(const int vals[], int size);

BarChart(const BarChart& BC);

BarChart& operator=(const BarChart& BC);

~BarChart();

std::ostream& display(std::ostream& ostr = std::cout)const;

std::istream& read(std::istream& istr = std::cin);

int max()const;

int min()const;

int average()const;

BarChart& merge(const BarChart& BC);

};

}

**Code NOT provided** (object file provided to be able to compile and run the program)**:**

**BarChart(int size = 1);**

Dynamically creates a BarChart with an array of "size" integers to keep the samples. if size is not provided, an array of one sample will be allocated

**BarChart(const int values[], int size);**

Dynamically creates a BarChart with an array of "size" integers to keep the samples and sets them to the incoming values in the integer array “vals”

**BarChart(const BarChart& BC);**

**BarChart& operator=(const BarChart& BC);**

Copy constructor and assignment operator.

**Code Provided:**

**std::ostream& display(std::ostream& ostr = std::cout)const;**

Displays the sample values as series of bar charts at shown above, returning ostream

**std::istream& read(std::istream& istr = std::cin);**

Reads the values of samples from the keyboard one by one, returning istream;

**int max()const;**

returns the largest value in the samples

**int min()const;**

returns the smallest value in the samples

**int average()const;**

returns the average value of the samples

**BarChart& merge(const BarChart& BC);**

Merges a BarChart into the current one and returning he current object.

The following main program should be working as follows, assuming the user entering 10 and 20:

int main() {

int vals[] = { 30,50,40 };

BarChart B(2), C(vals, 3), A(C);

cout << "Enter 2 Barchart value samples:" << endl;

B.read();

cout << "A: " << endl;

A.display() << endl;

cout << "B: " << endl;

B.display() << endl;

cout << "C: " << endl;

C.display() << endl;

cout << "Min value in B: " << B.min() << endl;

cout << "Max value in C: " << C.max() << endl;

cout << "B.merge(C) " << endl;

A = B.merge(C);

cout << "B: " << endl;

B.display() << endl;

cout << "C += B: " << endl;

cout << "A: " << endl;

A.display() << endl;

cout << "Average value of all samples: " << C.average() << endl;

return 0;

}

Enter 2 Barchart value samples:

1/2: 10

2/2: 20

A:

1:==============================

2:==================================================

3:========================================

B:

1:==========

2:====================

C:

1:==============================

2:==================================================

3:========================================

Min value in B: 10

Max value in C: 50

B.merge(C)

B:

1:==========

2:====================

3:==============================

4:==================================================

5:========================================

C += B:

A:

1:==========

2:====================

3:==============================

4:==================================================

5:========================================

**The Question bank: (some of these will be in the quiz)**

**1- Write the following constructor:  
BarChart(int size = 1);**

Dynamically creates a BarChart with an array of "size" integers to keep the samples. if size is not provided, an array of one sample will be allocated

**2- Write the following constructor   
BarChart(const int values[], int size);**

Dynamically creates a BarChart with an array of "size" integers to keep the samples and sets them to the incoming values in the integer array “vals”

**3- Write the Copy Constructor:**

**4- Write the assignment operator to set a BarChart to another;**

**BarChart& operator=(const BarChart& BC);**

5- Write the descructor.

**The following questions must be written ONLY by reusing the already existing methods:**

**6- Overload the unary + operator:**returns the largest value in the samples

**7- Overload the unary – operator:**

returns the smallest value in the samples

8- overload the integer cast operator to:  
return the average value of the samples

**9- Overload the binary += member operator to merge the right BarChart into the left one.**Merges a BarChart into the current one and returning he current object.

10- Overload helper operator >> to read the BarChart values using cin.

11- Overload helper operator << to Display the BarChart as displayed in this document.

12- Overload helper operator + to merge two BarCharts into a new BarChart and return it without changing the two original ones.

Implementing the above question the main should be able to be written as follows to have a similar (but not identical) output as the previous main:

int main() {

int vals[] = { 30,50,40 };

BarChart B(2), C(vals, 3), A(C);

cout << "Enter 2 Barchart value samples:" << endl;

cin >> B;

cout << "A: " << endl;

cout << A << endl;

cout << "B: " << endl;

cout << B << endl;

cout << "C: " << endl;

cout << C << endl;

cout << "Min value in B: " << -B << endl;

cout << "Max value in C: " << +C << endl;

cout << "A = B + C: " << endl;

A = B + C;

cout << A << endl;

cout << "C += B: " << endl;

C += B;

cout << C << endl;

cout << "Average value of all samples: " << int(C) << endl;

cout << "A = B: " << endl;

A = B;

cout << A << endl;

return 0;

}

Enter 2 Barchart value samples:

1/2: 10

2/2: 20

A:

1:==============================

2:==================================================

3:========================================

B:

1:==========

2:====================

C:

1:==============================

2:==================================================

3:========================================

Min value in B: 10

Max value in C: 50

A = B + C:

1:==========

2:====================

3:==============================

4:==================================================

5:========================================

C += B:

1:==============================

2:==================================================

3:========================================

4:==========

5:====================

Average value of all samples: 30

A = B:

1:==========

2:====================